

CHAPTER 5: FINDINGS

Based on an evaluation of the impact analysis discussed previously, and assuming that the water quality data presented in Exhibits 2 and 3 are representative of all CBM water in the study area, it is apparent that, at least in general, CBM water can be used in agriculture. Certainly it is acceptable for livestock water and there would be no danger from trace elements when it is used for crop irrigation.

5.1 AGRICULTURAL IRRIGATION

Some of the CBM water, that with the lower salinity and SAR, could likely be used as a sole irrigation water source for many of the crops in the area grown in the coarser textured, well-drained soils. Special management practices would likely be necessary to use the higher salinity CBM water on the more sensitive crops. These practices would include assuring adequate leaching and possibly using better quality water for part of the irrigation season. This in effect would be a dilution of the constituents in the CBM water.

The moderate to high SAR in most of the CBM water would cause the greatest problem in using it for agricultural irrigation. Careful monitoring of the soil would be advisable. When sodium levels in the soil become high and infiltration of the water into the soil becomes obviously slower, special management practices would have to be implemented. These practices would include adding a calcium source, such as gypsum, to displace the sodium, and assuring adequate leaching. If better quality water were used to accomplish the leaching, the results may be faster. The extra leaching would likely mitigate the potential increase in salinity that could occur from adding the gypsum.

The data from the CBM wells shown in Exhibits 2 and 3 demonstrate that the quality of the CBM water can vary considerably. The variation may be greater when thousands of wells are developed. If water with the lower to average salinity and SAR levels were available, there would be little problem in using the CBM water for agricultural irrigation. From a practical point of view, if only the poorer quality water was available, it would not likely be advisable to use it for irrigation, unless it were diluted or applied intermittently. The quality of the water from each unit or group of wells would have to be determined before specific recommendations for its use could be made.

5.2 SURFACE WATER DISCHARGE

Discharging the CBM water into surface streams and rivers may be acceptable under some circumstances. The quality constituents in low flows of CBM water may be diluted sufficiently to cause little concern of increasing the salinity or sodicity of the much larger flows of the receiving waters. However, when greater numbers of CBM wells are constructed and the flows increase substantially, discharge into the streams and rivers may become indefensible. If CBM flows were discharged into smaller drainageways and streams, it would have to be well controlled to minimize erosion and harm to riparian vegetation and aquatic habitats.

5.3 LIVESTOCK WATERING

It doesn't appear that CBM discharge water will harm livestock. The upper salinity limits for livestock is 10,000 mg/L. Livestock can tolerate and use water with TDS up to several thousand mg/L, with 3,000 mg/L set as the maximum goal by the MDEQ (Bauder 1999). Livestock should initially be monitored after providing CBM water since in some cases, the water could cause temporary diarrhea in livestock not accustomed to such water, but this problem should rapidly disappear as animals adapt to the new water supply.

5.4 OTHER IMPACTS

Impacts from the construction of roads, pipelines and drilling pads, and operation of the CBM gas and water production facilities will need to be minimized and mitigated. With careful management practices, impacts can likely be minimized and mitigated to an acceptable degree. The impacts caused by discharging the poorest quality CBM water to the surrounding land surface would be very difficult to mitigate, making the practice undesirable.

It is also important to understand that the discharges and uses of CBM water are regulated. MDEQ issues discharge permits (MPDES) for the use and/or discharge of the CBM water. A determination of the acceptability of CBM water will have to be made for each individual project on a site-specific basis.

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